Customer:
Channel 4 Time Team

Project:
Archaeological surveys

Solution:
Trimble R8 GPS and a Trimble S6 Robotic Total Station

Case Study

Trimble GPS steals prime time TV slot !

It's not often that a selection of survey kit gets the chance to feature on prime time TV, but Channel 4's Time Team has proved the perfect showcase for the introduction of Trimble instruments to a main stream audience.

2009 saw the series enter into its 15th year, and cover a wide range of locations across the British Isles and time periods from the Neolithic through Roman, Medieval and Tudor periods and up to the 19th century.

The origins of Time Team go back as far as 1991 when legend has it that Tim Taylor (series creator and producer) was sitting in a service station with Professor Mick Aston (chief archaeological advisor famous for his lurid taste in knitwear) escaping a particularly rainy day and Mick telling Tim how it was possible to read the layout of a medieval town just by walking the streets in a few hours. Tim wondered what could be done in three days….and the rest is history.

Site Selection

When it comes to selecting sites to be investigated, the show has a loyal viewing public and a good relationship with archaeological bodies throughout the UK, all of whom make suggestions. Development Producer Jim Mower, an archaeologist himself, also has a network of contacts to draw upon. "Site suggestions really can come from anywhere and at the beginning of the development process I will initially speak to colleagues and friends who have worked with us previously to see if they have any good ideas or any sites that might benefit from the type of archaeological evaluation we can offer. As the biggest non development led funder of archaeology in the UK, Time Team can offer a lot to sites that otherwise would never be looked at," explains Jim. "In terms of criteria, we try to fairly represent all regions across the UK and look at a variety of time periods but all sites have to throw up enough archaeological questions that we can realistically answer in three days. A challenge or twist is nice as well, along with a good central character or perhaps an event that we can tie the archaeology in to."

Jim is keen to stress that Time Team is all about a strong professional team, with a variety of skills, working together to solve a problem. Amongst these is Dr Henry Chapman who is principally responsible for all the surveying of the excavated trenches, artefacts and geophysics and much filmed with a variety of Trimble instruments. The data collected by Henry enables the team to understand the site quickly and accurately, and create 3D models when combined with data supplied by the OS. The end result is a comprehensive archaeological site map that allows the decision making process to continue apace in terms of where new trenches are and how best to use resources in the time available.

Dr Henry Chapman has been involved with Time Team for 8 years following a call from the programmes landscape archaeologist 'lumps and bumps'man, Stewart Ainsworth who is also a Landscape Investigator for English Heritage. After filming a new episode for the upcoming series on the private Colworth Estate in Bedfordshire, Henry kindly filled in a few gaps on his contribution to Time Team.

What is your role?

Henry Chapman: Initially my role was to undertake the surveying for Time Team which consists of setting out where geophysics and trenches will go, mapping everything as it is found and working with the archaeologists to ensure that all of the archaeology is recorded properly before we leave site. As time went on, my PhD in 3D digital landscape modelling became useful and I began working more closely with Stewart (Ainsworth) in the analysis of landscapes within the computer. Following on from my

> "decisions and strategies change constantly... the Trimble equipment is perfectly designed for this type of survey."

Continued overleaf ▶▶

background in wetland archaeology, my role soon expanded into working on the fringes of Environmental Archaeology. Hence, you'll sometimes see me with the survey pole, at the computer or wielding a soil auger taking environmental samples. It's quite a diverse role, but that is something that I love about Time Team.

Once a particular site has been selected, what is your survey schedule?

HC: Before we get to site I'll be involved in ordering the right digital mapping from the Ordnance Survey. But other than that, everything really does take place within the three days on site, often with an early start on day 1 in order to get survey control set up. On site, there are dozens of people involved, including the Time Team archaeologists, the production crew, the filming crews, directors, producers, local archaeologists and so it goes on. We can sometimes have in excess of 50 people working on a site. For the Live broadcasts there are many more.

....and during filming?

HC: My role during the filming is dominated by surveying, reacting to the needs of the moment, and ensuring that all information is recorded onto the computer so that maps can be printed out at any time. Maps of the 'current state of play' are useful since they can influence the planning process. But for the rest, every site is different. Sometimes I'll be spending time generating a 3D model of the wider landscape and analysing it to find routeways or visibility patterns between sites. Other times I'll be up to my knees in bog taking environmental samples and trying to work out how the landscape has changed over time.

Why does Time Team use Trimble instruments and what's in your tool box?

HC: I have used Trimble kit ever since I began working on Time Team. Previously I'd used a variety of different types of survey equipment, but when I got hold of Trimble's integrated survey GPS and EDM, I was hooked. Time Team demands a very reactionary approach, with decisions and strategies changing constantly. The Trimble equipment is perfectly designed for this type of survey, without the need to constantly download data before it can be examined. I currently use a Trimble R8 GPS and a Trimble S6 Robotic Total Station. Although the kit has never let us down, Trimble's UK distributor KOREC can provide any Technical Support we may need.

What does your survey system need to deliver?

HC: The integrated survey is fantastic, and saves so much time which is critical for the intensity of Time Team work. The ability to react to different situations whilst in the field without the need to upload survey information is excellent. Having said that, one of the most bizarre surveys I've done in recent years was in Cornwall last year. The director wanted a map of Europe to be drawn in sand on the beach so that trade routes could be explained. The problem was that is had to be filmed obliquely, so I morphed a DXF of Europe so that it looked correct from the position of filming. I georeferenced it from GPS positions and then used the map on the screen of the GPS controller to score out the outlines of the countries. The end result was fantastic and exceeded expectations.

Which site in the new series has been the most interesting from a survey point of view?

HC: The biggest survey challenge this year was probably Lincolns Inn in London. The density of buildings and trees, coupled with the tight time limits, stretched the integrated survey well. Other sites such as Knock Du in Northern Ireland were great too. The need to get an accurate 3D model of the fort there meant that I had to collect thousands of 3D survey points across a large area at a high resolution. The Trimble R8 was excellent for this, and the resulting model of the landscape generated in the computer (using ESRI ArcGIS) looked fantastic. It was also fun combining the GPS with geophysical equipment. At sites such as Radcot and Caerwent this year, we hooked the GPS to a Foerster Ferex multi-array magnetometer (state of the art geophysical equipment which detects tiny changes in the Earth's magnetic field) and to the Noggin cart GPR (also geophysical equipment) to enable immediate positioning for all of the geophysical data. Again, this speeded things up, the resulting data was more accurate and it allowed us to develop some new research angles at the same time.

What instruments and software did you use for the site above and what work was typically carried out?

HC: At Lincolns Inn I needed to use GPS with the S6 Robotic Total Station, constantly switching between the two. Linking together standing building survey with ground survey is always an interesting challenge. On the next shoot we are hoping to combine these methods with terrestrial laser scanning in addition to the geophysics. The great thing about survey these days and with the Trimble kit, is that the level of integration between different methods means that surveyors can become much more ambitious with their plans - and Time Team takes full advantage of that.

What happens to the data once it is collected?

HC: Once the data is collected it is normally processed within a GIS environment (ESRI ArcGIS). There are multiple end users for the data. I'll use it to generate maps of trenches, geophysics and finds which are circulated and help with making archaeological decisions in the field. I'll also use the data to generate 3D landscape models. The basic mapping data is passed in DXF format to the geophysics team for their reporting and records, and to the archaeologists who finally write the sites up for the archive. The resulting 2D maps and 3D models are also passed onto the Time Team graphics team who use them to generate the imagery you see on television. Particularly, the 3D models form the basis of many of the reconstructions that you see at the end of the show.

What have been your favourite 'out of the ordinary' survey moments?

HC: Over the years there have been numerous stories involving survey. We've used the GPS on a long pole to perform a shallow bathemetric survey at Loch Migdale in Scotland - I sent Phil Harding off with a dry suit to take the points for me. At Cheshunt I was challenged to race against Roman re-enactor surveyors to see who could map out the outline of a fort the fastest. We've even used the S6 Total Station to provide control for a 'green screen' whereby Tony Robinson could be placed within a reconstructed building. Survey control was needed to make sure that perspective worked between his movements and the projected building behind him, so I found myself mapping the positions of targets on the screen and integrating these with Raysan's (Raysan Al-Kubaisi deals with Time Team's graphics) graphical reconstructions. This year, I've even used the GPS to map how far a trebuchet could throw grapefruit as part of a cameo!

Best bits?

HC: Time Team is fantastic - you get to travel all over, work on some amazing sites and meet some great specialists. It can also be a challenge for survey, but I really love problem solving in the field. Seeing Mesolithic children's footprints on the beach in South Wales was perhaps my favourite bit of archaeology for the pure emotive element.

Many thanks to Dr Henry Chapman and Jim Mower: http://www.channel4.com/history/microsites/T/timeteam/

Contact us:

Please do get in touch for further information on any of the products or services mentioned in this case study, a demonstration, support or just a chat about your requirements.

T: **0845 603 1214**
E: **info@korecgroup.com**
www.korecgroup.com